



## Material Safety Data Sheet

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** DURACELL® Ultra Lithium  
**Product Identification:** Lithium Iron Disulfide Battery  
**Duracell Designations:** LF1500, FR6

**Product Use:** Energy Source  
**MSDS Date of Preparation:** June 8, 2009

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(United States of America)

### SECTION 2: HAZARDS IDENTIFICATION

**Physical Appearance:** Small cylindrical batteries

#### EMERGENCY OVERVIEW

CAUTION: Battery can explode or leak if heated, disassembled, shorted, recharged, exposed to fire or high temperature or inserted incorrectly. Keep in original package until ready to use. Do not carry batteries loose in your pocket or purse. Keep batteries away from children. Under certain misuse conditions and by abusively opening the battery, exposed lithium can react with water or moisture in the air causing potential thermal burns or fire. Liquid released from damaged battery is flammable and may present a fire hazard.

EU Classification of Preparation: Not classified as a dangerous preparation.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS Number	EINECS Number	Amount	Classification
Iron Disulfide	1309-36-0	215-167-7	<35%	None
1,3-Dioxolane	649-06-0	211-463-5	<8%	F R11
Lithium	7439-93-2	231-102-5	<7%	C, F, R14/15, R34
Lithium bis-Trifluoromethanesulfonimide (LiTFSI)	90076-65-6	Not Assigned	<7%	T, C, R34, R24/25, R52/53

Sulfolane	126-33-0		<2%	Xn R22
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#### SECTION 4: FIRST AID MEASURES

**General Advice:** The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused.

**Eye Contact:** If battery is leaking and material contacts the eye, flush thoroughly with copious amounts of running water for 30 minutes. Seek immediate medical attention.

**Skin Contact:** If battery is leaking and material contacts the skin, remove any contaminated clothing and flush exposed skin with copious amounts of running water for at least 15 minutes. If irritation, injury or pain persists, seek medical attention.

**Inhaled:** If battery is leaking, contents may be irritating to respiratory passages. Move to fresh air. If irritation persists, seek medical attention.

**Swallowed:** If battery is leaking and mouth area irritation or burning has occurred, rinse the mouth and surrounding area with tepid water for at least 15 minutes. Get medical attention immediately for treatment and to rule out the involvement of the gastrointestinal tract.

**Note to Physician:** This MSDS does not include or address the small button cell batteries which can be ingested. The primary toxic ingredients are lithium, lithium bis-trifluoromethanesulfonimide and sulfolane. Anticipated potential leakage volume is 1 to 5 mL, depending on battery size. Maximum leakage from an AA cell is 1.8 mL.

#### SECTION 5: FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** Batteries may burst and release hazardous decomposition products when exposed to a fire situation.

**Extinguishing Media:** Use dry chemical, alcohol foam, water or carbon dioxide as appropriate for the surrounding fire. For incipient fires, carbon dioxide extinguishers are more effective than water.

**Special Fire Fighting Procedures:** Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing. Fight fire from a distance or protected area. Cool fire exposed batteries to prevent rupture. Use caution when handling fire-exposed containers (batteries may explode in heat of fire).

**Hazardous Combustion Products:** Thermal degradation may produce hazardous fumes of lithium; hydrofluoric acid, oxides of carbon and sulfur and other toxic by-products.

#### SECTION 6: ACCIDENTAL RELEASE MEASURES

Notify safety personnel of large spills. Irritating and flammable vapors may be released from leaking or ruptured batteries. Eliminate all ignition sources. Evacuate the area and allow the vapors to dissipate. Clean-up personnel should wear appropriate protective clothing to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Carefully collect batteries and place in an appropriate container for disposal. Remove spilled liquid with absorbent and contain for disposal.

## SECTION 7: HANDLING AND STORAGE

Avoid mechanical or electrical abuse. DO NOT short circuit or install incorrectly. Batteries may explode pyrolize or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Replace all batteries in equipment at the same time. Do not carry batteries loose in a pocket or bag.

**Storage:** Store batteries in a dry place at normal room temperature.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

The following occupational exposure limits are provided for informational purposes. No exposure to the battery components should occur during normal consumer use.

Chemical Name	Exposure Limits
Iron Disulfide	None Established
1,3-Dioxolane	20 ppm TWA ACGIH TLV 100 ppm skin DFG MAK 20 ppm VL Belgium 20 ppm TWA Switzerland
Lithium	None Established
Lithium bis-Trifluoromethanesulfonimide (LiTFSI)	None Established
Sulfolane	None Established

**Ventilation:** No special ventilation is needed for normal use.

**Respiratory Protection:** None required for normal use.

**Skin Protection:** None required for normal use. Use butyl rubber gloves when handling leaking batteries.

**Eye Protection:** None required for normal use. Wear safety goggles when handling leaking batteries.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**Appearance and Odor:** Small cylindrical batteries. Contents dark in color.

**Water Solubility:** Insoluble

**Flash Point:** 35°F (2°C) (1,3-Dioxolane)

## SECTION 10: STABILITY AND REACTIVITY

**Stability:** This product is stable.

**Incompatibility/Conditions to Avoid:** Contents are incompatible with strong oxidizing agents and acids. Do not heat, crush, disassemble, short circuit or recharge.

**Hazardous Decomposition Products:** Thermal decomposition may produce hazardous fumes of lithium; hydrofluoric acid, oxides of carbon and sulfur and other toxic by-products. Iron disulfide will react with oxidizers to form sulfur dioxide and with acids to form hydrogen sulfide.

**Hazardous Polymerization:** Will not occur

## SECTION 11: TOXICOLOGICAL INFORMATION

### Potential Health Effects:

The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused. Contact with battery contents may cause severe irritation.

**Eye Contact:** Contact with battery contents may cause severe irritation.

**Skin Contact:** Contact with battery contents may cause irritation.

**Inhalation:** Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation. High concentration may cause central nervous system effects including headache, dizziness and nausea.

**Ingestion:** Swallowing is not anticipated for larger batteries due to battery size. Irritation to the internal/external mouth areas, may occur following exposure to a leaking battery.

### Acute Toxicity Data:

Iron Disulfide: No data available

1,3-Dioxolane: LD50 oral rat 5200 mg/kg, LD50 dermal rabbit 15,000 mg/kg, LC50 inhalation rat 68.4 mg/L/4 hr

Lithium bis-Trifluoromethanesulfonimide: LD50 oral rat 160-210 mg/kg

Sulfolane: LD50 oral rat 1941 mg/kg, LD50 dermal rabbit 4009 mg/kg, LC50 inhalation rat >12 mg/L/4 hr

**Chronic Effects:** The chemicals in this product are contained in a sealed can and exposure does not occur during normal handling and use. No chronic effects would be expected from handling a leaking battery.

**Target Organs:** Skin, eyes and respiratory system.

**Carcinogenicity:** None of the components of this product are listed as carcinogens by ACGIH, IARC, NTP or OSHA.

## SECTION 12: ECOLOGICAL INFORMATION

1,3-Dioxolane: EC50 daphnia magna 6950 mg/L/48 hr, LC50 sheepshead minnow 8294-12057 mg/L/96 hr.

Sulfolane: LC50 mosquito fish 1930 mg/L/96 hr.

This product is not expected to present an environmental hazard.

## SECTION 13: DISPOSAL INFORMATION

Disposal should be in accordance with national and local regulations. Large quantities of open batteries should be treated as hazardous waste. Do not incinerate except for disposal in a controlled incinerator.

Duracell lithium disulfide batteries are labeled in compliance with the EU Battery Directive 2006/66/EC.

#### **SECTION 14: TRANSPORT INFORMATION**

The transportation of lithium batteries is regulated as UN3090 by ICAO, IATA, IMO and US DOT. However, DURACELL lithium disulfide batteries are not subject to the other provisions of the regulations as long as they are packaged and marked in accordance with the regulations. (The lithium content of cells contained in this document is less than 1 gram. The lithium content of batteries contained in this document is less than 2 grams)

DURACELL certifies that all of its lithium batteries meet the requirements of the UN Manual of Tests and Criteria, Part III subsection 38.3. If you assemble these batteries into larger battery packs, it is recommended that you perform the UN Tests to ensure the requirements are met prior to shipment. Cells and batteries are to be separated so as to prevent short circuits and packed in strong packaging, except when installed in equipment. Except when installed in equipment, each package containing more than 24 cells or 12 batteries must be marked indicating that it contains lithium batteries and that special procedures should be following in the event that the packaging is damaged. In addition, each shipment must be accompanied by appropriate documentation and the package must be capable of withstanding the drop test requirements.

Shipping packages containing non-rechargeable lithium batteries must be labeled, regardless of size or number of batteries, with the following statement: "PRIMARY LITHIUM BATTERIES – FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT." The labeling requirement covers shipments via highway, rail, vessel or cargo-only aircraft and covers all shipments inside, into or out of the US. The label must be in contrasting color and the letters must be 12 mm (0.5 in) in height for packages weighing more than 30 kg (66 lbs) and 6 mm (0.24 in) in height for packages less than 30 kg (66 lbs).

Except for personal use, the shipment of lithium batteries aboard passenger aircraft is no longer allowed. Airline passengers may continue to have non-rechargeable lithium batteries for their equipment and a reasonable amount of spare non-rechargeable lithium batteries for their equipment in their carry-on luggage – not in their checked baggage. For more information, air travelers should consult the US Department of Transportation (DOT) Safety Travel web site at <http://safetravel.dot.gov>

Effective January 1, 2009, new ICAO regulations for air cargo shipments require a reduced package size quantity and the use of two new labels. The maximum quantity a single master carton must not exceed 2.5 Kg. The new caution label requires the proper UN for the batteries being shipped and a telephone number for information. In the case of primary lithium metal batteries, the UN number is UN3090. The package must also bear a new 'cargo aircraft only' label.

At this time, IMO and ADR continue to follow Special Provision 188 from the UN Model Regulations.

#### **SECTION 15: REGULATORY INFORMATION**

**EU Classification of Preparation:** Not classified as a dangerous preparation.

**REACH:** These products are manufactured articles and not subject to REACH registration requirements. As articles, Duracell lithium disulfide batteries do not contain any of the SVHCs published in the Candidate List on October 28, 2008.

**EU Labeling:** None Required

Labeling is not required because batteries are classified as articles under the both REACH and the Dangerous Preparations Directive and as such are exempt from the requirement for labeling.

<b>SECTION 16: OTHER INFORMATION</b>
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**P&G Hazard Rating:** Health: 0      Fire: 0      Reactivity: 0

EU Classes and Risk Phrases for Reference (See Sections 2 and 3)

C Corrosive

F Highly Flammable

T Toxic

Xn Harmful

R11 Very Flammable

R14/15 Reacts violently with water, liberating extremely flammable gases

R22 Harmful if swallowed.

R24/25 : Toxic in contact with skin and if swallowed.

R34 Causes burns

R52/53 : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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Data supplied is for use only in connection with occupational safety and health.

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